SUPPORT DOCUMENT

for the Air Operating Permit issued to

Kimberly-Clark Tissue Company
(KCTC)
2600 Federal Ave.
Everett, Washington

State of Washington
DEPARTMENT OF ECOLOGY
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INTRODUCTION

This Operating Permit Support Document fulfills the operating permit rule "Statement of Basis" requirement and explains particular portions of the air operating permit for Kimberly-Clark Tissue Company (KCTC). This document is not part of the operating permit for KCTC. Nothing in this document is enforceable against the permittee, unless otherwise made enforceable by permit or order.

Mill Description

KCTC is located in Everett, Washington, and is an integrated pulp and paper manufacturing facility. The site produces a wide range of tissue products including paper towels, toilet paper, napkins. The facility operates continuously with three shifts per day.

The pulp mill is currently producing bleached sulfite pulp. Most of this pulp is used by the paper mill along with purchased kraft pulp, semi-mechanical pulp, and recycled fiber to manufacture tissue products for both the commercial and consumer markets.

In general, wood chips are cooked with acid in digesters to make a pulp slurry. This slurry is then separated into pulp and liquor fractions. The liquor is concentrated and burned as fuel in the plant's recovery boiler. The pulp, is bleached. The bleached pulp either is immediately used in the paper mill or is dried, pressed, and baled for storage. An ammonia absorption tower recovers sulfur dioxide. The mill's unit processes are described further below.

Pulping Process

Wood chips from whole logs and sawmill residuals arrive at the plant by truck, barge, and rail car. The chips are stockpiled onsite in piles and silos. The chips are screened and conveyed by a covered belt to a batch digestion process to make pulp. Digestion occurs in an ammonium-based sulfite process that cooks the chips in large-batch digesters by using heat and chemicals. The cooking process separates the wood into its primary fractions: wood fibers and lignin, the binding material that holds the fibers together.

The chemicals used in the cooking acid are ammonium bisulfite and sulfurous acid. Raw materials used to create the cooking acid are anhydrous ammonia, molten sulfur, and water. Each process unit is hooded and vented to the acid plant ammonium-based absorption tower, which collects and recovers sulfur dioxide. The sulfur dioxide recovered from the flue gas is converted to ammonium bisulfite for use in the digestion process.

After cooking, the pulp is washed to remove the cooking liquor and organic solids. The spent sulfite liquor is concentrated in multiple-effect evaporators to form approximately 50 percent solids. This concentrated liquor is then sprayed into the plant's recovery boiler where the organic content in the liquor is burned, producing steam to operate the digesters and evaporators. The pulp is sent through screens and washers before going to the bleaching process.

Wastewater from the pulp mill is discharged to either an onsite primary treatment process for removal of solids, or an onsite secondary treatment process for removal of solids and oxidation

of organic substances. The treatment process used depends on the source of the wastewater and its constituents.

Pulp Bleaching

The pulp is sent to the bleach plant to brighten the pulp. Chemicals alter and remove the lignin compounds in the pulp that remain after washing. After each bleaching stage, the mixture is washed. Wastewater from the bleach plant is sent to secondary wastewater treatment system.

Screening, Drying, and Baling

The bleached pulp is screened and centrifuged to remove dirt and contaminants from the finished pulp. Rejected material is sent to primary treatment. At this point, the cleaned pulp may be used immediately in the paper mill, or it may be dried on the pulp drying machines and stored for later use and/or sale. When needed, the dried pulp is wetted in a repulper to form a slush to be sent to the paper mill. Some of the dried sulfite pulp is also sold to other mills. Purchased dried pulp is also used daily as part of paper mill recipes.

Paper Mill

The paper mill receives pulp from the sulfite process as well as blends of secondary fiber and purchased pulp. Water is added to the pulp to make about a one-half of one percent solution. Wet and dry strengthening agents, and optional dyes may be added. The solution is conveyed to a Fourdrinier wire followed by a felt press. It is then dried and "creped" on Yankee dryers. For some products, optional after-dryers may be used after the Yankee dryers. For paper towels and toilet paper, the dried material is rolled, dyes and design imprints are added, and final embossing and texturing may be done. The product is rewound on rolls and perforation tears may be added. A rotating blade then cuts the long roll into smaller ones. For napkins, the product is cut and folded in the finishing process. The product is wrapped and conveyed to a distribution building for transport. Five paper machines are used to produce the paper products.

Paper machine and finishing waste is called broke, and is recycled to the mill. Wet and dry broke from the paper machines and finishing areas are placed in a beater. The broke is treated with hypochlorite to bleach the dyes and to aid defibering by breaking down chemicals in the paper. Hypochlorite is consumed by the reactions with the fiber, dyes, and additives. Excess chlorine is neutralized with sodium bisulfite. The slushed broke is pumped to a broke storage chest and reused in the process.

Utilities

Five boilers (No. 14, and 7 through 10) are available to supply steam for plant operations: one cogenerating wood-waste boiler, three dual-fuel boilers, and a recovery boiler. Boiler No. 14 is a woodwaste boiler (installed in 1995) produces about 435,000 pounds of steam per hour. Boilers Nos. 7 through 9 can burn either gas or oil and operate in swing capacity to provide extra steam as needed. Boiler No. 10 is the sulfite recovery boiler. The recovery boiler is used to burn spent sulfite liquor, and is capable of producing 330,000 pounds of steam per hour. Boiler No. 10 also burns gas as necessary.

The woodwaste boiler burns approximately 800,000 wet tons of fuel per year. The fuel is provided by local sawmills and wood products companies, and consists of sawdust, bark, and other wood waste. In addition, KCTC burns approximately 12,000 dry tons of dewatered sludge per year from the primary and secondary clarifiers of the wastewater treatment plant. This sludge contains about 60 percent woodwaste fiber. Minor amounts of other fuels are burned, including wood pallets and other waste paper products from onsite operations.

Emissions from boiler No. 14 are vented to a baghouse to remove particulate material. The boiler is part of a cogeneration facility that meets plant steam needs, and also generates a total of about 325,000 megawatt-hours of electrical power per year. This is enough power to supply 21,000 residential customers.

Boiler No. 10 burns spent sulfite liquor, which is liquor that has been concentrated after the digestion process. Sulfur from the cooking mixture that is bound up in the spent sulfite liquor is liberated during combustion and converted to sulfur dioxide. An ammonia absorption tower captures the sulfur dioxide, which is reused in the mill. Brinks-type mist eliminators remove mist droplets. Particulate emissions are removed by a Dynawave reverse jet caustic scrubber located after the absorption tower. Sulfur dioxide emissions are further reduced by this scrubber.

STATEMENT OF BASIS

When the Department of Ecology issues a draft operating permit, it is required to provide a statement that sets forth the legal and factual basis for the draft permit conditions, including references to the applicable statutory or regulatory provisions. [WAC 173-401-700(8).]

I. Assuring Compliance With All Applicable Requirements

An operating permit must contain terms and conditions that assure compliance with all applicable requirements at the time of permit issuance, [WAC 173-401-600(1)]. The Department of Ecology has determined that the requirements listed in Appendix A to the permit do not apply to the facility, as of the date the permit is issued, for the reasons specified. [WAC 173-401-640(2)]. Not all of the inapplicable requirements are listed in Appendix A. Requirements that were considered obviously inapplicable were excluded from the list of inapplicable requirements. Appendix C of the permit contains the abbreviations used in the permit. The state Regulatory Orders that impose limitations and requirements on the permittee are listed in Appendix B of the permit. These limitations and requirements are on going. Also new sources are required to complete performance tests, notification and record keeping under 40 CFR 60.7 and 40 CFR 60.8. These new source requirements for the new hog fuel boiler (Boiler No. 14) were all completed by July 16, 1998.

Compliance with the conditions in the permit is deemed to constitute compliance with applicable requirements as contained in the permit on which the terms and/or conditions are based, as of the date that the permit is issued. [WAC 173-401-640(1).

Alternate operating scenario
The permittee did not request any other alternate operating scenario; and therefore, WAC 173-401-650 becomes an inapplicable requirement.

MACT Standards
The permittee may be regulated by the 40 CFR Part 63 National Emission Standards for Hazardous Air Pollutants for Source Categories when they become effective.

Application
Ecology received a complete application prior to April 20, 1998. Therefore, the Compliance Assurance Monitoring (CAM) rules will be applicable in the next permitting issuance period or if a significant permit modification is made prior to renewal affecting specific emission unit with potential to emit greater than major source thresholds.

I.A. Descriptions and Comments on Specific Permit Conditions

Process Description
Cogeneration Boiler (No. 14)
KCTC, in conjunction with Snohomish County PUD No. 1, built a cogeneration boiler that burns primarily wood waste. This wood-waste boiler can produce 435,000 pounds of steam per hour as well as producing 325,000 megawatt-hours of electrical power. The boiler uses fabric filter emission control system. This baghouse includes bags of a "goretex" filtering material that improves filtration efficiency. Boiler No. 14 has a single emission point, the wood-waste boiler exhaust stack. The stack dimensions are 165 feet in height and 14 feet in diameter.

Fuel to the new No. 14 boiler is primarily clean wood waste. Sludge from the mill's primary and secondary wastewater treatment dewatering filters, and mill wood and paper wastes disintegrated in the onsite shredder are also be burned. Additionally, up to 12 tons per day of contaminated wood waste may be used, under the terms of the No. 14 Boiler Fuel Plan submitted to Ecology June 29, 1994 (supplemented and revised July 27, 1994). The primary backup fuel for this boiler is natural gas. The secondary backup fuel is No. 2 distillate with a sulfur content below 0.05 percent by weight. Order Number DE 00AQIS-241 permits the burning of some wood containing creosote.

Steam is produced for electrical power production and internal mill uses. The distribution between users and actual usage rates for produced steam varies over time, depending on power grid and mill operational demands. During maintenance or emergency shutdown situations, the baghouse will have to be bypassed for 2 to 3 hours. This will occur during both startup, when the boiler is warming up, and shutdown, when the boiler is cooling. Bypassing is necessary because low temperatures will cause condensation in the bags and plugging. Visible emissions may exceed 10 percent during periods of bypass.

Permit Condition A.1

The limit for NOx (180 lbs/hr) is continuously monitored to assure compliance. The limit from 40 CFR part 60 (184.8 lbs/hr) is also shown for completeness. It was calculated using formula from the CFR and assuming oil firing. This calculation provides the most restrictive limitation under this regulation. A continuous emission monitor (CEM) is used to pull a sample from the air emissions, and analyze the NOx present. The computer part of the CEM uses the air flow data entered from a previous source test and the NOx present to calculate and then log the NOx concentration present. This information is used to calculate the pounds of NOx per hour.

Permit Condition A.2
The limit for CO is continuously monitored to assure compliance.

Permit Condition A.3
The limit for SO_2 (79.2 lbs/hr) is continuously monitored to assure compliance. The limit from 40 CFR part 60 (492.8 lbs/hr) is also shown for completeness. It was calculated using formula from the CFR and assuming oil firing. This calculation provides the most restrictive limitation under this regulation.

Permit Condition A.4
Yearly tests for VOC indicate virtually no emission of this pollutant. This is due to the extremly effiecient design and firing control of this unit. Some source tests have indicated no detection for the pollutant. Yearly source test assure compliance for this parameter.

Permit Conditions A.5, A.6
The limit for PM (17.4 lbs/hr) is monitored annually to assure compliance. PM10 is largely a function of the total PM load. The limit from 40 CFR part 60 (61.6 lbs/hr) is also shown for completeness. It was calculated using formula from the CFR and assuming oil firing. This calculation provides the most restrictive limitation under this regulation. Also shown for completeness is the WAC 173-410 citation (0.1 gr/dscf). This is an order of magnitude less restrictive than the limit set by Ecology Order DE 98-AQI028.
Baghouse conditions are suggested surrogate operating parameters for possible noncompliance with the particulate emission requirements. The baghouse condition will act as a trigger mechanism for taking corrective action. Exceedance of the trigger mechanisms is not by itself a violation of the permit. Failure to take corrective action is considered a violation of the permit.

Permit Condition A.7
The limit for Opacity (10%) is continuously monitored to assure compliance. The limit from 40 CFR part 60 (20%) is also shown for completeness. Opacity is also determined through visual observation once a week to assure compliance.

Permit Conditions A.1 thru A.7 limits that were arrived at through a Notice of Construction (NOC) Approval Order DE 98-AQI028 per WAC 173-400-110, represent BACT for this emission unit.

Process Description
Pulping Operations

KCTC pulp mill operations have no direct emissions or emission points. All of the exhausts, tank vents, and relief gases are collected and sent into the "secondary system" following the recovery boiler, where the great majority of pollutants are absorbed prior to discharge from the recovery boiler stack. The following information is provided for completeness.

KCTC stores wood chips in piles and silos and then conveys them to the digester building, where they are stored in chip hoppers above each batch digester. There are currently 8 operational digesters. Chips and cooking acid are added to the digesters. The acid is made onsite by burning sulfur to produce SO_2, which is combined with ammonia and water to produce the ammonium bisulfite cooking acid. This acid is made in the secondary system. The acid cooking in the digesters dissolves the lignin, leaving relatively pure cellulose.

After cooking, the pressure in a digester is relieved by directing the gas through a series of accumulators and back to the secondary system. Spent sulfite liquor (SSL) is then used to facilitate dumping the digesters to the digester dump tanks. Emissions from these tanks also vent to the secondary collection system. Pulp is then pumped to the SSL washer system. The SO_2 and volatile gases released in the pulp washing operations also enter the secondary collection system. Pulp washed in the countercurrent washer operation leaves the process cooled and odor free. At that point, the pulp goes to the screen room and the bleach plant. The concentrated spent liquor from the washers is sent to the evaporators and then to the chemical recovery boiler.

Process Description

Recovery Boiler/Secondary System (No. 10)

The No. 10 recovery boiler is a Babcock & Wilcox unit that burns spent pulping liquor and is a part of the acid recovery process. The boiler is capable of burning approximately 1,375,000 pounds of spent liquor per day and producing approximately 330,000 pounds of steam per hour. The exhaust gas from the boiler itself passes through a cooling tower, an absorption tower, an emission-control scrubber, and a demister unit before exhausting to the atmosphere. Nox is controlled through post-combustion ammonia injection. Acid recovery is the function of this process, and the absorption tower is the primary collector of SO_2. The emission control scrubber (a reverse-jet Dynawave unit) provides the final emission control step with additional SO_2 and particulate matter control. All of the SO_2 emissions collected from the pulping operations are controlled by this system. Boiler No. 10 has a single emission point. The stack dimensions are 202 feet in height and 6 feet in diameter.

The recovery boiler operates much like a base-load boiler for the mill because the chemical recovery operation tracks directly with the pulp production processes. Even though the digesters are a batch operation, there are sufficient numbers to approach a steady-state operation for spent liquor burning. Operational scenario options do not really apply in this case because the boiler burns whatever liquor is available. KCTC does have the option to burn natural gas to supplement the operation at times but does not routinely do so during normal operations.

One option that occurs periodically is the washing of the No. 10 boiler booster fan. This fan, which provides the driving force for exhausting air from the stack, coats up with ammonium sulfate deposits every few months. These deposits must be washed off, and the washing is done during the run to avoid boiler shutdown. When washing occurs, the excessive water vapor that is

produced clouds over the windows of the opacity monitor, making accurate opacity readings impossible. The monitor windows are cleaned immediately following the washing to enable continuous monitoring.

Permit Condition B.1
No specific NOx limit for this unit exists. Its NOx contribution is limited by the total NOx limit set for both boilers. See Permit Condition C.1 below.

Permit Condition B.2
The limit for SO2 (300 ppm) is continuously monitored to assure compliance.

Permit Condition B.3
The limit for particulate is monitored monthly to assure compliance.

Permit Condition B.4
The limit for Opacity is continuously monitored to assure compliance. Opacity is also determined through visual observation once per week to assure compliance.

Permit Condition B.5
The limit for ammonia is monitored annually to assure compliance.

Permit Conditions B.6 and B.7
These conditions require reporting of operational parameters.

Permit Condition C.1
The combined limit for Nox is continuously monitored at both No. 14 and No. 10 Boilers to assure compliance.

Process Description
Power Boilers(Nos. 7 Through 9)
The three power boilers at the Scott Paper Everett mill are capable of burning both natural gas and residual fuel oil. Boiler No. 7 was installed in 1953 and is a Riley F type, rated at 150,000 pounds of steam per hour. Boiler No. 8 is a Combustion Engineering model BU50-BPX and was installed in 1954. Boiler No. 9 is identical to No. 8 and was installed in 1955. Boilers Nos. 8 and 9 have a rating of 165,000 pounds of steam per hour. There are no emission controls on any of these boilers. Each boiler has its own stack, providing three separate emission points. The stack dimensions (for each stack) are 102 feet in height and 6 feet in diameter.

These three power boilers provide both peak steam demand service as well as backup to the recovery boiler (No. 10) and the wood-waste boiler (No. 14). The mill's operational steam needs dictate when these boilers are running.

Permit conditions D.1 and D.2
These conditions require reporting of operational parameters.

Process Description
Catalytic Oxidizer (EM5)
EM5 was installed in 1979. It is different from a conventional paper machine in that it uses a proprietary process to manufacture towel and wiper products. In this process, chemicals are added to the paper before it "cures" on a dryer. Some volatile organics are released during this curing process, so a catalytic converter was designed into the paper dryer exhaust stream when the machine was built.

EM5 (as with the other paper machines) contains only categorically exempt emission units except for the catalytic oxidizer exhaust. A NOC for New Source Review was required for the installation of this pollution control device. The existence of this NOC approval (DE 79-335) requires that the catalytic oxidizer exhaust be classified as a significant emission unit under WAC 173-401-530(2)(a). The exhaust gas flow from the paper dryer is initially heated to 600 to 700°F by a natural gas heater. The gas then flows through the catalyst section of the device. The bed is a honeycomb array that currently uses a platinum-based catalyst. The catalytic effect of the platinum effectively oxidizes the organic material at reduced temperatures. The treated gas discharges through a vent on the paper mill roof.

Permit condition E.1
Limit for particulate is 50 lbs/day. Less than 5 lbs per day is emitted based on calculations using EPA AP 42 emission factors. Tracking gas usage is used to assure compliance.

Permit condition E.2
Limit for hydrocarbon is 100 lbs/day. Less than 5 lbs per day of VOC (hydrocarbon) is emitted using NCASI TB 646 factor for calculations. Annual source testing is performed to assure compliance.

I.B. Comments on Facility-Wide General Requirements

Permit Condition 10.
Permit condition 10 is the generic SO2 limitation from WAC 173-410-040(1)(f) of 1000 ppm which addresses emissions from units other than a recovery system, a blow system or an acid plant. EPA raised the issue of compliance regarding this requirement given the discrete interval of testing for some units and the existence of units for which no monitoring is required. Ecology has imposed periodic discrete monitoring for those units deemed to warrant monitoring. Ecology has not imposed monitoring for units unlikely to have a reasonable potential of exceeding SO2 emission limits.

Permit Condition 11.
Permit condition 11 consists of two parts. The first part is an inclusion of WAC 173-400-105(5)(h) which allows that monitoring and reporting requirements may be temporarily lifted during periods of monitoring system malfunction provided the permittee adequately explains such periods.

The second part of condition 11 is based on what Ecology considers an unlikely but possible scenario where recorded monitoring data is simply lost. Ecology will allow a 90% recovery rate each month for monitoring data if the permittee provides an adequate explanation for the cause of the lost data. Ecology expects the permittee to make every reasonable effort to maintain the integrity of all monitoring results. An allowance is specified for missing monitoring results under certain conditions so that these defined conditions are defined as "not penalized," thus reducing the administrative burden on the source and the permitting authority.

II. Insignificant Emission Units

The facility-wide general requirements apply to the whole facility, including insignificant emission units and activities (IEUs), as required by the operating permit rule. The rule states, however, that IEUs are not subject to monitoring requirements unless the generally applicable requirements in the State Implementation Plan (SIP) impose them. [WAC 173-401-530(2)(c)]. The Washington SIP does not impose any specific monitoring-related requirements for the facility-wide requirements for IEUs at this source. The permit, therefore, does not require any testing, monitoring, reporting, or recordkeeping for insignificant emission units or activities.

III. Regulatory Orders

The permittee is subject to regulatory orders. Order DE 78-106 was issued to direct the sulfite pulp mill sources compliance with the new WAC regulation WAC 173-410. Two other orders are notices of construction: for pollution control equipment for a new paper machine (Order DE 79 - 335), and the new No.14 Cogeneration Boiler (Order DE 98AQI028). A majority of the most stringent emission limits for the facility are contained in these orders.

These orders establish source-specific limitations, but also include default limitations established by state regulations. Orders are not intended to be separate legal sources for default limitations that are based in state regulations. Therefore, for limits derived directly from state regulations that were included in Regulatory Orders for convenience purposes, Ecology considers the regulation and not the Order to be the "applicable requirement" for purposes of Title V.

An important issue regarding any Title V permit is the basis of authority for the applicable requirements. This is particularly true regarding monitoring and reporting requirements. The basis of authority is used to determine federal or state-only applicability. Many of the applicable requirements come from orders issued by Ecology. The period of time during which these various orders were issued may in some cases span decades. Orders issued years ago do not clearly set forth the basis of authority. Also order consolidation has gone on in the past, further confusing the original basis of authority. Ecology decided the effort, besides being difficult, was not necessary as WAC 173-401-615 offered a solution to this problem. In the case of KCTC, the issue of state-only or federal applicability was put aside, it relies entirely on WAC 173-401-615 as the basis of authority for the type and frequency of monitoring. WAC 173-401-615 requires monitoring and recordkeeping sufficient to assure compliance with the terms and conditions of the permit. Monitoring and recordkeeping requirements based on this regulation are federally enforceable.